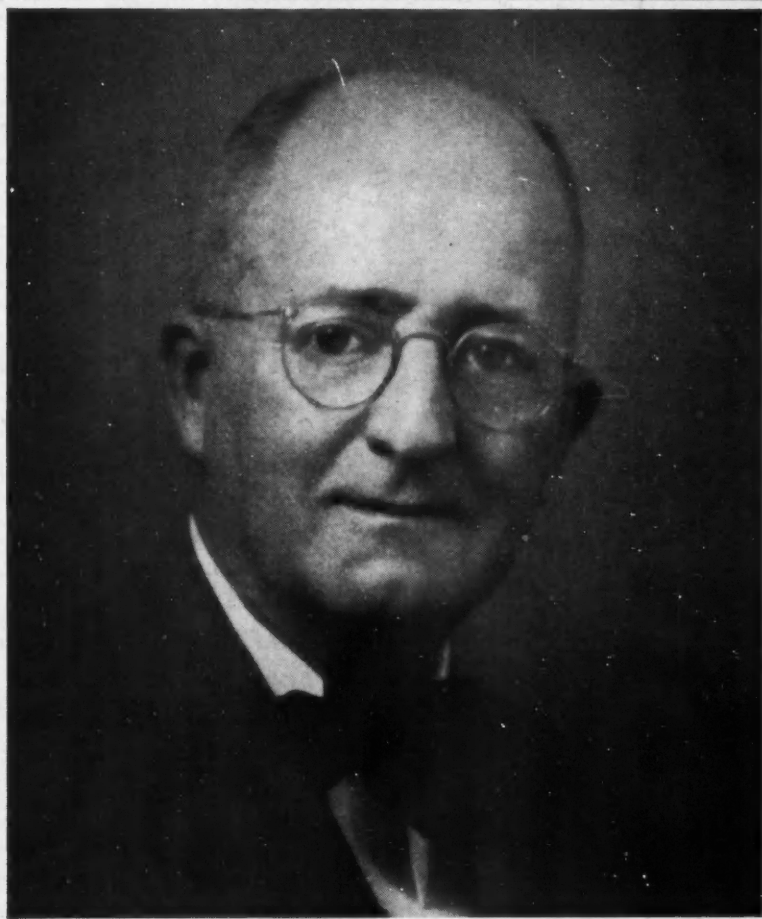


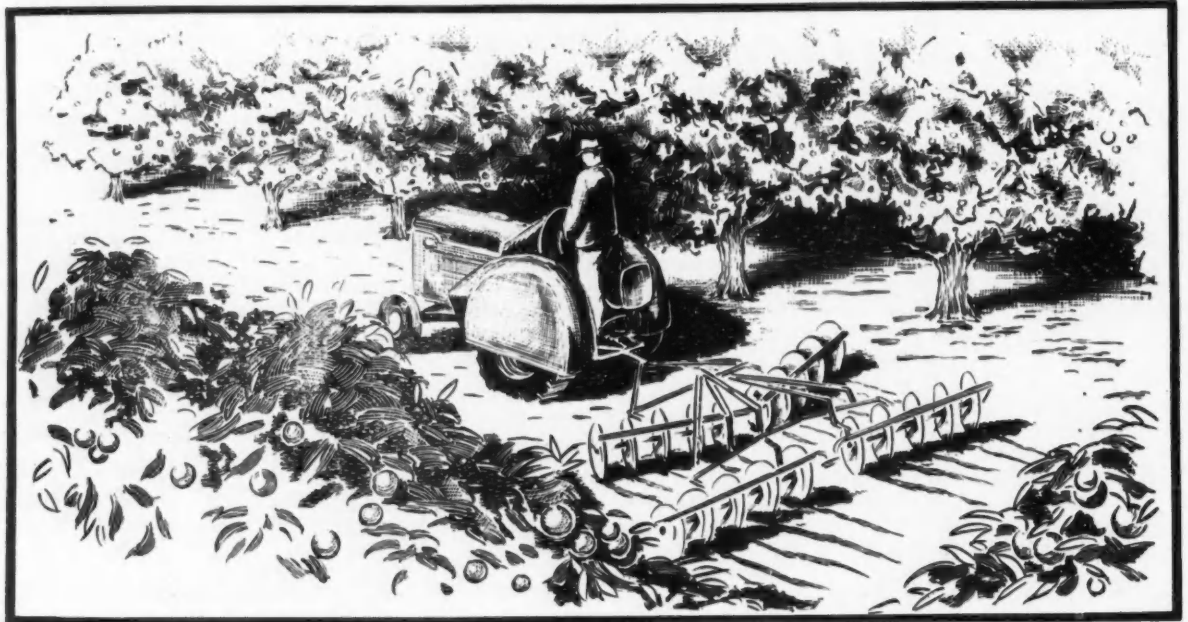
# The *Citrus Industry*



ARTHUR C. BROWN  
Plant Commissioner, Florida State Plant Board

J. FRANCIS COOLEN, EDITOR  
AGRICULTURAL EXPERIMENT STATION

# Let IDEAL FERTILIZERS HELP YOU PRODUCE TO THE UTMOST!



## A Hungry World Needs All It Can Get Of Florida's Fruits and Vegetables

Since 1893 IDEAL Brands have produced more Florida crops than any other fertilizer. Consider this fact when planning your grove and vegetable crop fertilizing programs for the coming growing season. Remember that a hungry world stands in dire need of all the food it can get and that you—and we—must do our share to provide that food.

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**WILSON & TOOMER  
FERTILIZER COMPANY  
JACKSONVILLE FLORIDA**

# Citrus Fruit Products Research<sup>1/</sup> . . .

M. K. VELDHUIS  
U. S. Citrus Products Station 2/  
Winter Haven, Florida

At Meeting of Florida State Horticultural Society.

The opportunity of reporting on the work of the U. S. Citrus Products Station during the past year is greatly appreciated. During the year both the Department of Agriculture staff and the Florida Citrus Commission Research Fellows have devoted their efforts entirely to investigations on citrus products and utilization of citrus fruit as juice, sections, concentrates, marmalades, etc., and the profitable utilization of byproducts of these operations. Improved methods of producing better quality products at lower costs increase the amount of the fruit that can be marketed in processed forms, thus stabilizing the market and increasing returns to the growers.

The development of the citrus products industry in Florida has been nothing short of phenomenal. This is brought out by a comparison of the production figures for the 1934-35 and 1943-44 seasons. These figures are representative of the trend. During this period the total canned citrus pack increased from 4,322,000 cases to 30,973,000 cases, figured as 24 No. 2 cans per case. This is better than a seven-fold increase and few industries can boast of such an expansion in this short time. During this period there was slightly less than a three-fold increase in the total citrus crop and it is evident that a major portion of the increased production was taken by the canners. During this period the amount of Florida grapefruit used by the canneries increased from one-third the total crop to two-thirds the total crop. During the same period processing of Florida oranges increased from about one-seventieth to almost one-fourth of the total crop. With the anticipated large increases in yield of citrus fruit in Florida, even larger percentages of utilization by processors and much larger packs of

citrus products are to be expected. This trend was shown at the beginning of the past season, before the hurricane destroyed a large part of the crop, at which time processors were expecting to handle one-third more fruit than in the preceding year.

Large amounts of citrus fruit products have been purchased by the government. With the end of hostilities these purchases will be greatly reduced, and it will be necessary for the industry to sell even larger amounts on domestic markets. Qual-

ity of the products delivered will be one of the principal factors determining the total volume that can be sold. It is hoped that many of those returning from the armed services will want to continue to consume citrus juices in the quantity now being furnished them.

Interest in research on citrus products is by no means confined to Florida. An increased interest is being shown by almost all the citrus-producing sections of the world. Not only the other citrus-

(Continued on page 9)

## Sul-Po-Mag

WATER-SOLUBLE SULPHATE OF POTASH MAGNESIA



**Supplies the Element of Youth and Vigor in Growing Crops**

In the flush growth of young plants, particularly in the spring and early summer, you have high hopes for favorable crop yields.

In this early stage of rapid growth, Magnesia is found in its highest percentage in many plants, according to many chemical analyses. No wonder that Magnesia is often acclaimed the Plant Food of Youth!

Some chemical composition studies indicate that Nitrogen and Magnesia are both high in percentage in highly vegetative plants, demonstrating the value of Magnesia for vigorous growth.

Magnesia stimulates early, vigorous and rapid growth and Potash promotes the growth substances produced within the plant. These two essential nutrients are provided by nature in harmonious balance in Sul-Po-Mag in sulphate form for use in mixed fertilizers.

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## Spring Blossoms Are Bursting Out All Over

### What Shall We Do About It?

Now is the time to order the needed X-CEL PLANT FOOD to set and develop a heavy crop of early fruit . . . . Our experienced and dependable field representatives are available on call . . . May we also suggest the use of our other valuable X-Cel products?

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**X-CEL SEEDS**

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# Jackson Grain Company

Faithfully Serving Florida Agriculture for Thirty-Seven Years

**Tampa 1**

**Florida**





Publication office at Bartow, Florida. Entered as second class matter February 16, 1926, at the post office at Tampa, Florida, under the act of March 3, 1879. Entered as second class matter June 19, 1933, at the post office at Bartow, Florida, under act of March 3, 1879.

## How Many Oranges And Grapefruit Are Too Many?

With increasing production of oranges and grapefruit, and with curtailments in government purchases of fresh fruit and citrus products, the citrus industry may well consider fundamental problems involved in the orderly and profitable marketing of this fruit.

Fortunately, while citrus crops are larger than established channels have previously absorbed, there is a sound basis for increased sales provided obstacles are recognized and plans for overcoming them are made and carried out.

It is the purpose of this discussion to consider four phases of the situation:

1. Based upon previous sales experience there may be a surplus of citrus fruit.
2. Based upon nutritional needs of the American public there is not a surplus but a shortage of citrus fruit.
3. What are the additional markets for citrus fruits and products?
4. How can additional markets be developed most quickly and easily?

Considering these statements and

J. L. HEID

Florida Citrus Cannery Cooperative  
Lake Wales, Florida

questions in detail:

1. Based upon previous sales experience there may be a surplus of citrus fruit. Although, a general seller's market continues and prices advance, when shipments of citrus fruits or products into specific markets have materially increased, prices have actually shown weakness. It is small wonder that the extent of new plantings has caused concern among experienced citrus men.

2. Based upon nutritional needs of the American public there is a shortage of citrus fruit. Actually, this premise is, as obvious as the first. In this, the best fed nation in the world, surveys in all parts of the country unanimously reveal that more than half of the population suffers from nutritional deficiencies.

These nutritional deficiencies are not confined to persons of restricted education or income, and a deficiency of great prevalence in every income group is that caused by lack of sufficient citrus fruit in the daily diet.

We consume increasing quantities of highly refined foods such as starch, sugar, polished rice, highly milled flour, shortening, distilled liquors, etc. As an example: we

normally consume refined sugar, carefully freed from minerals and vitamins, equivalent to five pounds of citrus fruit daily, and complain of sugar shortages while the total crop of oranges and grapefruit is equivalent to less than two ounces of juice per day, one third of the minimum required quantity for optimum health. Yet we speak of a surplus of citrus fruits!

It is not implied that there is harm in consuming sugar. On the contrary, sugar is a valuable source of quick energy. It is usually combined with other foods to improve taste and stimulate appetite. However, the fact that such a large portion of our diet is composed of refined foods makes it absolutely essential to eat compensating quantities of the seven basic foods richest in necessary minerals and vitamins if we are to avoid nutritional deficiencies.

Citrus fruit is one of the seven basic foods. No other food can substitute for citrus fruit, any more than citrus can substitute for any of the other basic foods. No synthetic vitamin can substitute for citrus any more than a star football carrier can substitute for a football team. Oranges, grapefruit, tangerines, lemons and limes contain three vitamins of the C group (antiscorbutic factor, J: postulated antipneumonia factor and P: capillary permeability factor) which must be

\*Presented to Florida Farm Bureau Citrus Institute, Winter Haven, Florida, January 16, 1946. (Acknowledgement is due to officers of the Florida Citrus Cannery Cooperative, particularly to L. G. Foster, for suggestions incorporated in this discussion.)

supplied in the diet every day for optimum health. These factors, which are not stored, but must be supplied daily, together with five other vitamin and nine mineral constituents have been found in citrus fruits in naturally balanced proportions not duplicated in any other fruit or vegetable available and relished in comparable quantities.

Deficiency of essential nutrients abundant in citrus fruit may be responsible for many manifestations of malnutrition including anemia, increased susceptibility to infectious diseases, shortness of breath, sore or swollen joints, hemorrhage conditions, the location of which may be influenced by growth and stress, or deficient calcium in the blood. Cuts, scratches and broken bones may not heal normally; bones may be improperly formed or brittle; teeth may not be sound and resistant to decay; gums may be tender and soft; disease and other toxins may be unduly poisonous . . . The list could be extended, but this is sufficient to illustrate the importance of citrus fruit for optimum health.

One of the most striking nutritional demonstrations in history resulted when England, shut off from normal food supplies by submarine warfare, and with shipping space at a premium, rejected a program based upon synthetic vitamins and took the entire American output of concentrated orange juice. Protective quantities of concentrated juice were furnished to nursing and expectant mothers and children under five. Despite unfavorable living conditions and restricted medical facilities, infant mortality and death in child birth dropped to the lowest figure in the history of England, and child health attained the highest level to date.

We of the citrus industry have not fulfilled our responsibility for convincing the medical profession and the American public that for the protection of Mothers and infants, for the normal development of children, and for optimum health and longevity of adults it is necessary to include in the daily diet from two ounces of citrus juice for infants up to ten ounces for nursing Mothers and invalids. In the diet of adolescents and adults larger quantities are never injurious, but upon the contrary have demonstrably beneficial effects.

Our failure to explain the role of citrus fruit in a balanced diet could be no more strikingly emphasized than by the fact that while an average of six ounces of citrus juice

is required for every citizen, we speak of a surplus of citrus fruit when the total crop of oranges, grapefruit and tangerines is equivalent to less than two ounces of juice per capita, per day, and the crops of lemons and limes are smaller. If all our citrus fruit and products were equitably distributed, the total available quantity would not be sufficient to supply half our daily needs, and when one consumer averages as much as ten ounces of orange or grapefruit juice per day, the equivalent of four other individuals get none at all; It is slight wonder that over half the men, women and children in this nation reveal symptoms of nutritional deficiencies.

3. What are the additional markets for citrus fruits and products? It may be guessed that one of the difficulties involved in increasing the sales of citrus fruit and products is that we have failed to emphasize the fact that citrus fruit must be sold in competition with other foods, and not in competition with itself.

In citrus advertising much stress has been laid upon minor differences between fruit of different varieties or fruit from different growing areas. Perhaps fruit in one area contains a little more juice while the juice in fruit from another area contains a little more ascorbic acid. Perhaps one orange is a little sweeter, another a little yellower. Possibly a lime is a shade sourer than a lemon. Most people already know that a tangerine is easier to peel than an orange while an orange is easier to juice than a tangerine. Nature varies all these factors slightly from variety to variety, from season to season and from one producing area to another.

From the standpoint of nutrition and sales the important fact would appear to be that even the poorest orange, tangerine grapefruit, lemon or lime is a better source of balanced essential food elements which it contains than any other food available and relished in equal quantities and these essential food factors are well preserved by:

Proper handling and distribution of fresh fruit.

Proper canning and distribution of juice or hearts.

Proper concentration and distribution of concentrates.

Proper freezing and distribution of frozen citrus products.

So long as there is insufficient citrus fruits and citrus products combined, to meet half our minimum nutritional requirements, there should

be no injurious competition between one citrus fruit and another, or between the crops of one producing area and another. Neither should there be unfavorable competition between fresh fruit, and canned, concentrated or frozen concentrated juice.

Each consumer should be advised to select the citrus fruit or citrus product which appeals to his personal preference, convenience or mood, or which is most available, or is available at the price he wishes to pay. The important thing is that the average individual must consume citrus fruit or high quality citrus products equivalent to at least six ounces of juice daily if he wishes to avoid malnutrition, the symptoms of which are not easily recognizable, but which will prevent him from enjoying full health.

Since there isn't enough citrus fruit to supply this minimum requirement for all consumers, each should take all he can get and supplement it with other foods which most nearly approach citrus, although the best are less than half as good. Such foods include: Apricots, cantaloupes, huckleberries, papayas, raspberries, strawberries, tomatoes, asparagus, broccoli, cauliflower, cabbage, mustard, turnips, kale, dandelion and spinach greens, green lima beans, string beans, kohlrabi, and green onions.

In considering these foods, it should be noted that no one substitutes entirely for citrus, but in combinations and triple quantities they provide a reasonably satisfactory substitute, provided special precautions are taken to prevent excessive losses of ascorbic acid during preparation and cooking.

The market for additional citrus fruit and products is not hard to discover. It is every man, woman and child in the United States now averaging less than six ounces of citrus juice daily. Informal observation of citrus workers in the heart of a citrus producing area indicated that individuals averaging 12 ounces of carbonated beverages daily were consuming less than two ounces of citrus juice. When refined sugar products, which are pleasant thirst quenchers and which supply quick energy, are substituted for citrus juice which is also a pleasant thirst quencher and supplies quick energy, and in addition supplies urgently needed, naturally balanced minerals and vitamins, there is a real field of competition for citrus fruit and products.

4. This brings us to the question

How can additional markets for citrus fruits be developed most quickly and easily? Unluckily, there is probably no quick or easy way to accomplish this object, but the lack of sufficient fruit to meet the nutritional requirements suggests an application of the method used by merchants during this seller's market to clear their stocks of slow moving merchandise: displaying such merchandise with a sign reading: "Only one to a customer."

If doctors dentists and nutrition teachers and supervisors are first convinced of, and the public educated to, the indispensibility of citrus fruit in the daily diet to add years to life, and life to years,—and realize that there isn't enough to go around, our problem of marketing the orange and grapefruit crops to the mutual advantage of consumers and producers will be solved.

The California Fruit Growers Exchange has endowed valuable fundamental research on the importance of citrus fruit in nutrition and has been active in disseminating pertinent information to specialists.

The Florida Citrus Commission has stimulated research on the value of citrus fruits and is organizing an extensive educational program to insure rapid dissemination of knowledge on the importance of citrus in the diet. Doctors, dentists, nutrition teachers, editors, writers and state welfare organizations are primary objectives. Civic and women's clubs are secondary objectives and these agencies may well serve as intermediates in carrying the story effectively to all consumers.

In marketing our citrus crops, the growers of Arizona, California, Florida, and Texas share a common problem of disposing of the entire crops from all producing areas at a reasonable return to growers, shippers and processors. It makes little difference in the overall situation just what fruit goes to any specific market, or what channels of distribution are employed. The vital necessity of every grower in every area is that all the fruit from every producing area is totally and profitably marketed each season if a stable price structure is to be attained. Failure to profitably market all the fruit from any one area will unfavorably influence, and may demoralize, the marketing of crops from all the others.

In advertising our citrus crops, it is increasingly important to recognize where the competition lies and direct advertising at that target, not misdirect it stressing relatively unim-

portant differences in citrus fruits or products.

If skillfully planned and well organized efforts which are now in evidence are successful, we may see synthetic vitamins added to a wide variety of deficient foods. While such additions may render these foods less deficient, it is important to consumers and to the citrus industry to prevent anyone from being led to believe that such additions will render any deficient, unbalanced food an even partially satisfactory substitute for citrus fruits or products.

Competing deficient foods have been active in the field of exploiting specific advantages. Citrus has been comparatively inactive in this field. Perhaps the citrus industry might advantageously seek federal and state research on human nutrition more nearly commensurate with the skill which has been expended upon studying, and disseminating information upon, the food requirements of sheep, cattle, horses, mules and hogs. Man, the end product of this research and education is in need of a little attention of his own.

(Continued on page 22)



## Why these easy-to-handle bags save time and manpower

Growers, farmers, and manufacturers are saving precious hours of handling time by specifying Multiwall Paper Bags.

These sturdy, compact bags save minutes all along the line. They are quick and easy to load . . . easy to stack . . . easy to open, too.

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# State Plant Board Alert To Protect Growers' Interests

The householder, the storekeeper, the manufacturer—in fact, almost everyone who has valuable property in the form of personal effects, homes, stores, or factories—protects himself against losses from fire, storm, or theft through the purchase of insurance policies.

There is a form of protection which benefits growers, as well as those engaged in allied industries such as packing houses, manufacturers of insecticides, fertilizers, and fungicides, transportation lines—in fact, almost everyone residing in this state whose chief source of revenue is derived from the production, processing, and sale of agricultural products. This is insurance against the entry, establishment, and dissemination of plant pests with resultant increases in costs of production through the need for application of eradication and control measures, reduction in crops, and limited markets brought about by the application and enforcement of quarantine measures.

In Florida this protection is afforded through the inspection activities of the State Plant Board. A fire insurance policy does not guarantee against fire. A theft insurance policy does not prevent theft. By the same token, the Plant Board does not guarantee that destructive plant pests will not slip into the state, nor that crop losses will not follow the entry of such invaders. But growers may rest assured that the Plant Board inspectors at Pensacola, Jacksonville, West Palm Beach, Fort Lauderdale, Miami, Key West, and Tampa are alert to see that major pests do not enter the state from foreign countries or from other states in the Union. Citizens and growers who purchase nursery stock bearing a certificate issued by the Board's Nursery Inspector are assured of the fact that the trees or plants purchased have been inspected and that no major plant pests were found on the property on which they were grown. Grove owners know that Plant Board employees make periodical inspections of all citrus plantings in Florida in search of new and destructive pests and diseases.

## ARTHUR C. BROWN

Plant Commissioner, State  
Plant Board

Just as there are policy holders who, through indifference or malice, fail to keep their properties in a manner calculated to reduce to a minimum the possibility of loss through fire or theft, there are growers, some un-informed and others with full knowledge of the risk involved, who will purchase or sell uninspected trees and shrubs, or who will attempt to smuggle in prohibited plant material. Commercial insurance companies can protect themselves and their stockholders from losses likely to be brought about by indifferent or careless policy holders through cancellation of policies issued. Unfortunately, the Plant Board cannot protect its policy holders—the growers of Florida—in a like manner.

Insurance against the entry, establishment, and spread of plant pests and diseases is, and should be, a co-operative effort participated in by the Board's employees and every citizen of Florida. The Board has facilities for learning of the presence of major plant pests in other states and foreign countries, for evaluating their economic importance and the degree of risk of entry into Florida and the need for the adoption of restrictive plant quarantines. Entry of such pests can be retarded, but not prevented, by quarantine action. If the citizens of Florida cooperate with the Board, entry of destructive pests and diseases may be delayed for years. If, on the other hand prohibited plants, budwood, cuttings and other propagation material are deliberately smuggled into the state destructive plant pests fully capable of causing serious economic losses are likely to be introduced and widely disseminated throughout the state.

The Plant Board regulations require nurserymen to have their plantings inspected at regular intervals. If no unusual pest conditions are found, the nurseryman is furnished with inspection certificate tags. One tag must be attached to every package of nursery stock moved

from the property. Furthermore, the nurseryman must report to the Board's Nursery Inspector the serial number of the certificate tag used the number and kind of plants contained in the package, and the name and address of the buyer. This information is required not for the purpose of prying into a nurseryman's business affairs, but for sound pest control reasons. Information of this nature is filed in the Board's office at Gainesville and if, at any later date, citrus canker, citrus black fly, Japanese beetle, or other major plant pests are found in any particular nursery, it would be a comparatively simple matter to compile a list of all plants moved from the affected property together with the names and addresses of the buyers. Inspectors could, under this arrangement, immediately begin to inspect all plants moved from that nursery and eradication measures if desirable, could be started at once and not delayed for months while authorities were attempting to ascertain from the nursery owners a list of the host plants moved.

Thus the use of the nursery inspection certificate tag, together with the record of all plants moved from each nursery in Florida, as well as from other states, is a form of insurance against losses from attacks by insects and diseases affecting plants, and the citizens of Florida are partners with the Plant Board in this insurance business. It is the duty, therefore, of all citizens to insist that plants or trees purchased from a nurseryman be accompanied by a valid inspection certificate issued by the Board's Nursery Inspector. If it is necessary to purchase nursery stock from outside Florida, prospective buyers should write to the Board's Nursery Inspector and inquire as to out-of-state nurserymen who are qualified to ship plants into the state.

In conclusion we beg of you—do not bring in plants from the tropical or sub-tropical countries of the West Indies, Central and South America and the far east. To do so is to run a grave risk of bringing in insect pests and diseases capable of ruining our horticultural or agricultural industries.

# CITRUS FRUIT PRODUCTS RESEARCH 1/

(Continued from page 3)

producing areas of the United States, but South America, the Mediterranean area, and even China are planning for increased production and processing. There seems to be some shift in interest toward more fundamental information as a basis for improvement of processed products.

In this paper a brief review of the principal projects at the U. S. Citrus Products Station will be given and progress indicated. There will not be sufficient time, however, to go into much detail. Major projects which have received attention during the past year include concentrated citrus juices, methods of peel oil determination, the fatty material of citrus juices, Bacteriological work, and powdered citrus juice. As each phase of the work reaches an appropriate stage, results are published and reprints are made available to all interested parties.

**Concentrated Orange Juice:** Large quantities of orange juice have been concentrated in Florida for shipment to Allied Nations where they have been rationed to small children and mothers. The concentrate has a high content of vitamin C and very valuable for this reason. However, it was found that in some cases gas formed in the cans and caused the cans to swell. Studies were undertaken to determine the cause of this difficulty.

It was not known whether the gas formation was due to microorganisms or chemical breakdown; samples were prepared of pasteurized, unpasteurized and chemically preserved 650° Brix-concentrated orange juice and stored at several temperatures. In some of the unpasteurized samples stored at room temperature fermentation developed rapidly and from this it was concluded that it is desirable to pasteurize the final concentrate as it is filled into the containers. However, this was not the whole story. When samples of chemically preserved or pasteurized concentrates were stored at room temperatures, within a few months sufficient gas developed to swell the cans. It is believed that in this case the gas was produced by the chemical breakdown of some of the constituents in the concentrate. At a temperature of 120° F. sufficient gas production occurred to swell the cans in a few

weeks. Carbon dioxide was found to be the principal constituent of the gas which formed in the swelled cans, regardless of whether chemical decomposition or microbiological fermentation had taken place. Chemical analyses were made of the concentrate, both before and after storage, and included reducing and non-reducing sugars, titratable acidity, vitamin (Ascorbic acid), and pectic acid. Comparisons of color and flavor are also made. It was found that the vitamin C disappeared very rapidly at 120° F. and was quite stable in cold storage

at 35° F. Storage of concentrates of this strength at room temperatures or above for more than brief periods of time is likely to affect the vitamin C content adversely.

In general, it appears advisable to pasteurize the final concentrate and to keep it under refrigeration in order to prevent gas production and loss of ascorbic acid. The results of these experiment are to be published in detail shortly.

It is not known definitely which compounds decompose with the production of gas at elevated and

(Continued on page 16)

## PUMPS

## PIPE

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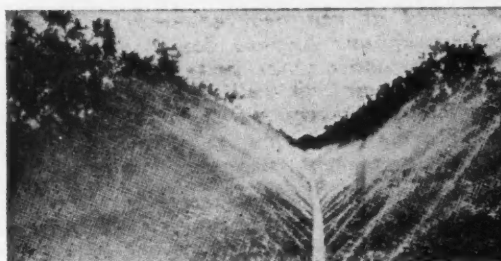
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## WORK OF STATE PLANT BOARD

Taking cognizance of certain criticisms of the Customs Inspection Office in Miami, appearing in a recent issue of a Miami daily newspaper, and realizing that the criticism was aimed indirectly at the State Plant Board, Plant Commissioner Arthur C. Brown has issued in some detail a resume of the work of the Plant Board at Miami.

The criticism specifically complained that a number of passengers on a Pan American plane from Porto Rico were held up at the Miami terminal for nearly an hour while customs inspectors went through the regular course of inspection. Since the passengers embarked in United States territory and debarked without having touched at any foreign port, it was asserted that inspection of their baggage was unnecessary and ill-advised.

Replying, Commissioner Brown submits statistics showing that during the period from July 1, 1945, to January 10, 1946, a period just more than six months, inspectors at the Port of Miami intercepted sixty-five plant pests brought in from the Island of Porto Rico. That is an average of ten pests per month intercepted at one port of entry from one island possession. Anyone familiar with the rapidity with which plant pests multiply will have no need to call on his imagination to realize the injury which might have been done to Florida vegetation had those sixty-five pests been permitted to enter the state and been turned loose in our citrus and truck growing sections.

The work of the Plant Board Inspectors has been responsible for keeping out innumerable plant pests which if permitted entry, would have done incalculable damage to the citrus groves and truck farms of Florida. These inspectors are on the alert, not only at Miami, but also at Tampa, Key West, Jacksonville and other ports of the state. To their efforts is due in large measure the growth and expansion of the citrus and trucking industries of the state. The officers and inspectors of the State Plant Board are due the appreciation and the support of these industries.

## MERITED APPROVAL

In a recent issue, the Agricultural Bulletin of the Atlantic Coast Line Railroad contained

the following well earned congratulations to a noted Florida worker along horticultural lines, with all of which this publication heartily concurs:

"We extend our heartiest congratulations to Dr. A. F. Camp, Vice Director in charge of the Citrus Experiment Station at Lake Alfred, Florida; Dr. Milton P. Jarnagin, Head of the Department of Animal Husbandry of the Georgia State College of Agriculture, Athens, Georgia; and Dr. T. D. Spies, Director of the Nutrition Clinic of Hillman Hospital, Birmingham, Alabama, in their selection by The Progressive Farmer as "Man of the Year in Service to Agriculture" in the states of Florida, Georgia, and Alabama, respectively.

'About twenty years ago citrus fruit trees in some Florida groves began to show serious deterioration, and no amount of the commonly used fertilizers were able to restore their vigor. Deficiency of secondary elements was largely responsible for the decline in vigor and productiveness of the trees. Dr. Camp and his staff started to work about ten years ago on a nutrition program that would correct those deficiencies and keep the trees healthy. They have evolved a program that has proven quite effective and is now in general use particularly on sandy lands where the secondary elements including magnesium, manganese, copper, and zinc play an essential role. The application of their findings has made a very important contribution to the restoration of groves to normal health, and the production of larger crops of higher quality fruit."

## "COALS TO NEWCASTLE?"

The product of Florida citrus canning and concentrate plants have long been appreciated and shipments have been made to all parts of the world. It now appears that those plants are developing a new market in a big way. The recent shipment of 120,000 cases of grapefruit and orange juice to California, a competing citrus producing state, is proof of the popularity of the Florida product. Another shipment of 150,000 cases is due to go forward during the present month with regular shipments throughout the year.

## SNIVELY HONORED

John A. Snively, Jr., one of the best known citrus factors in Florida, was honored by his fellow-citizens of the Junior Chamber of Commerce in Winter Haven as the outstanding citizen of the community for the year 1945.

Snively is president of the Florida Orange Festival and has for years been prominently identified with the citrus interests of Florida. It was through his initiative and his herculean efforts that the citrus interests of the state raised enormous funds for the construction of bombing planes during the early stages of World War II.

Citrus growers throughout the state will agree that his selection by the Jaycees of Winter Haven is well deserved.



## The Freezing Preservation Of Citrus Hearts

By Dr. A. H. Stahl, Asso, Horticulturist, U. of F. Agricultural Experiment Station  
At Meeting Florida State Hort. Soc.

(Concluded from last issue)

Several kinds of anti-oxidants were tried in several concentrations. Since the only one to show any advantages was ascorbic acid we will discuss the use of ascorbic acid in preventing oxidation and browning in some detail. The ascorbic acid treatment was applied to the raw sections of grapefruit during preparation for freezing or to the syrup or other solutions used on the frozen fruit. The treated sections could be kept exposed to the air at room temperature for several hours without any noticeable effect. The frozen product kept for over 14 months without darkening and after thawing these treated samples kept their color and flavor for several hours without noticeable change. To each 500 grams of grapefruit hearts 0.1 gram of 1-ascorbic acid was added by dissolving in the syrup were found to retard discoloration and aided in preventing off-taste but were not as effective as this higher concentration. The fruit hearts were also sprayed or immersed in ascorbic acid solutions. These solutions were prepared by dissolving the oxidation-retarding material (ascorbic acid, in this case) in water, citric acid or sugar solutions, or in the citrus juice itself. Grapefruit hearts were soaked for 15 minutes in an aqueous solution containing 1 part 1-ascorbic acid in 150 parts of grapefruit juice. These were packaged dry pack without syrup and after 10 months' storage no discoloration showed up after thawing, even after several hours at room temperature.

Ascorbic acid may also be applied in powdered form directly to the fruit. This way also proved effective in retarding discoloration and development of off flavors by oxidation but not as effectively as when in liquid form. If this process is used on large containers almost the entire amount of ascorbic acid should be thoroughly mixed with

the top layer of fruit to a depth of 2 to 3 inches. It is in this top layer that most oxidation takes place and more anti-oxidant is needed here than in that underneath where it is not as readily in contact with the air.

Three different freezing temperatures were compared, 5 degrees, -5 degrees and -20 degrees F. The best samples were found to be those quickly frozen at -20 degrees F. but the differences were very

(Continued on page 13)



### For 20 years . . . .

The famous NACO 5 STAR BRANDS containing a balanced ration of the minor elements - Magnesium, Manganese, Copper, Zinc, Iron and Borax - have proven their worth in Florida's groves.

**There is still a great deal to be learned about secondary elements and few definite facts can be stated about them, but we believe that for proper grove maintenance, the application of a small quantity of many of them is of greater value than the use of a large amount of any one of them.**

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BALANCED FERTILIZERS**

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. . . . FLORIDA**

## Contour Planting And Soil Conservation . . .

Florida's only commercial grove planted on the contour was undamaged by erosion during the last summer's record breaking rains while serious washing and gullying occur-

"The idea was a little new to me at the time and I must admit that I was worried a little about the cultivating and care of this type of planting," Olson said in reporting on his

experience with orange trees on the contour.

"It was hard to tell how much benefit we derived from this type of planting during the last drought as the trees are too small," Olson said. "However, there was no wilting during this period. The heavy rains during the past summer showed pretty well the benefits of this type of planting. More water fell during July, August and September this year than I can recollect having fallen before, and there was not a single gully washed inside the planting even on the steepest slopes. This clearly proves that both moisture and soil were conserved by contour planting.

"I am very well pleased up to now with contour planting on hilly land," the citrus grower declared. "It is a little early to say everything is better than the old type of planting but I certainly know there are some benefits derived from it."

To help in marketing or picking the fruit, Olson recommended that new contour plantings be staked out and that a map be prepared showing in detail the tree rows. "You can take such a map and lay out the varieties you want so picking crews do not have to drive all over the grove for each picking," the grove owner explained.

District Conservationist Peacock said that such a map could be prepared as part of the conservation planning for the grove.

Both Peacock and District Chairman Bullard invited grove owners to discuss contour planting with them



This is the new pattern of planting in Florida's only commercial citrus grove on the contour. It was planted three years ago by John L. Olson near Haines City with help from the Soil Conservation Service, which is recommending that new citrus plantings on hilly land be made on the contour. Last summer's heavy rains caused no erosion damage here. The cover crop is the new summer legume hairy indigo.

red in many groves planted in straight rows on hilly land.

That was the report this week by D. B. Bullard of Lake Wales, chairman of the Polk Soil Conservation District Service when they recommended that citrus trees planted this winter be placed in contour rows.

At the same time, District Chairman Bullard offered the assistance of the Soil Conservation District in running lines and staking out rows that wind around the slope on the level. This assistance is a part of the complete farm conservation planning available from the District, the chairman explained.

The contour grove to which the Soil Conservation leaders referred is the 40-acre planting of John L. Olson near Haines City. It will be three years old in February, and the experience in planting and operating this grove has led to improvements in methods of contour planting, District Conservationist Peacock said.



This orange grove planted in straight rows up and down the hill was severely damaged by gullies during excessive rains of last summer. Unless control measures are used, these washes will grow larger with every heavy rain.

## THE FREEZING PRESERVATION OF CITRUS HEARTS

(Continued from page 11)

slight. When thawed, those frozen more quickly stood up longer and had fewer broken cells than those slower frozen. Freezing temperature, however, is not as important as some of the other factors, especially deaeration in producing product.

The samples were held at storage temperatures of 5 degrees F. and—5 degrees F. and very little difference was detected. A few samples that were held at 20 degrees F. did not hold up as well but took on an oxidized flavor after several months' storage. The samples having a high syrup content did not freeze at 20 degrees F. but were still syrupy. The results indicate that a storage temperature around 0 degrees F. was much preferred over one around 15 degrees to 20 degrees F.

It is very important, in order to have a very good frozen grapefruit heart product to have a good moisture and air-proof package. The best packages were found to be those which gave the best protection from drying out and from air. The glass cup, tin can, cellophane or pliofilm bag liner in a cardboard box or the heavily waxed cardboard tub were found to be good packages in the order named. The glass cup and tin can were slightly more effective because it was possible here to hold the fruit in

vacuum, but a very good product was held for 14 months in the other packages also without discoloration or off flavors. The ordinary paper ice cream container was satisfactory for holding the hearts without loss in quality for only two or three months after which time excessive drying out and oxidation caused off-flavors, poor texture and discoloration.

### Freezing Orange Hearts

The above procedure was repeated for several varieties of both round oranges and Mandarin oranges. Very good frozen Pineapple and Valencia orange hearts were obtained even after 14 months' storage when similar procedures were used which gave good frozen grapefruit hearts. Parson Brown and Hamlin varieties gave only fair results. The orange hearts did not require as high a sugar solution as the grapefruit hearts and were best when packaged in their own juice.

The frozen tangerine and Temple orange hearts were very good. One of the best products made was the frozen Temple hearts packaged in their own juice. The Temple and tangerine orange hearts were more easily prepared than the round or-

ange hearts, in that they could be packed without removing the locular wall.

### Freezing Mixed Pack

A very good frozen product was made by freezing half grapefruit and half orange hearts together. Another good combination was half Pineapple orange and half tangerine in various syrups.

The results obtained in our investigation on freezing citrus hearts is very encouraging and show that a superior product can be obtained, thus giving the Florida citrus grower another way in which he can distribute and sell his crop and thus help in stabilizing the citrus industry.

## INDIAN RIVER GROWERS TRY PLANTING

Five Indian River County growers are trying plantings of blue lupine this season to determine whether it is suitable as a winter cover crop in this section. Five hundred pounds of the seed for the plantings were obtained through the office of County Agent Marcel Boudet.

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● When you sweeten your grove soils with d/p DOLOMITE you sweeten your profits, too, because DOLOMITE not only releases "acid-locked" plant foods but also supplies the calcium and magnesium that are essential to tree health and high quality fruit of finer flavor. Make your annual application now and assure better fruit and higher profits



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## Planting And Caring For The Home Orchard

G. H. Blackmon, Horticulturist  
Florida Experiment Station

The home orchard composed of well-chosen varieties is important, when properly cared for, it will supply fruits and nuts in season. During years of heavy production, there probably will be a surplus which can be sold on local markets when there is a demand. But for home use, you will want the same high quality product as you will for markets.

Fruit and nut trees are generally planted during the period from December to March. Most deciduous trees are dormant during these months and are easier to get to live following transplanting. However, if desirable, citrus can be set during the summer months while the rainy season is on. If there is a choice of location, select the one which will best meet the requirements of the varieties to be grown. The most fertile well-drained soil you have is best, other factors being favorable. With all trees except pecans and black walnuts it is important that the site of the planting have good air drainage so as to reduce frost hazards. In north Florida it is necessary to provide some protection for citrus during cold months if the place is not naturally protected.

The soil should be prepared by thoroughly disking before you are ready to transplant the trees. Stake off the area so as to locate the individual trees a suitable distance apart. Most fruit trees in the home orchard can stand about 20 to 25 feet apart each way. If a few pecans are to be grown, these should be placed at least 50 ft. distance. Where desired, they may be set in the or-

chard along with such fruits as peaches and plums.

Dig the holes of sufficient size to admit the roots without crowding. Twelve to 18 in. across and about the same depth will accommodate the roots of most trees except pecans and other nuts. The surface soil should be placed to one side and not mixed with the subsoil so that it may be used to fill the hole in covering the roots. Set the trees as deeply as they stood in the nursery as evidenced by difference in color of bark at the ground line. Prune off broken and bruised roots and cut the tops back one-third to one-half. After the tree roots are in place, fill hole three-quarters full with the surface soil and make firm, and then pour in enough water to soak the soil, then finish filling the holes, leaving a slight depression about the trunk of the tree.

In caring for the home orchard there are several factors which should be considered. Nutrition is important and must be provided as needed for satisfactory production. Commercial fertilizer containing about 5% nitrogen, 7% phosphoric acid and 5% potash is generally satisfactory to apply. In some instances it may be necessary also to supply zinc and one or more of the other minor elements for best results. The fertilizers are applied in the spring and the minor elements at the same time if applied to the soil. If more convenient, zinc, manganese and iron can be sprayed on the foliage if the plants require one or more of these.

Usually, one or two pounds of fertilizer per tree for each year of attained age will be sufficient to meet the requirements of the trees. In some instances it may be necessary to vary these amounts, depending on the general fertility level of the soil.

Cultivation should be attended to as necessary. If the orchard is of the larger home planting size, it will be possible to do the cultivation with disk harrows. In many instances, though, the home orchard occupies the same space used for growing vegetables and, when this is the case, the cultivation of the interplanted crop will take care of all the land except small areas around the trees which may be torn up with garden tools.

Some pruning will be required to take care of surplus wood growth in various types of fruits, but very little in pecans. Most of this pruning is done during the dormant season although some can be done during the growing season.

In deciduous fruits such as peaches, plums and pears, the trees are pruned so as to open up the top to admit light and for adequate distribution of fruiting wood. Some trees will require some heading back of the branches. This is especially true with pears.

Injurious insects and diseases must be controlled with suitable insecticides and fungicides. For example, larvae in peach and plum fruit can be prevented with an arsenical spray applied when half of the blossoms have fallen. For full information on the control of insects and diseases please write the Florida Agricultural Experiment Station.

The home orchard of adapted varieties, properly planted and cared for, will reward you with delicious products that will have considerable value for home consumption. We hope that success will crown your efforts which you will put forth in producing home fruits. In this connection, if we can be of service to you, please do not hesitate to ask your Experiment station.

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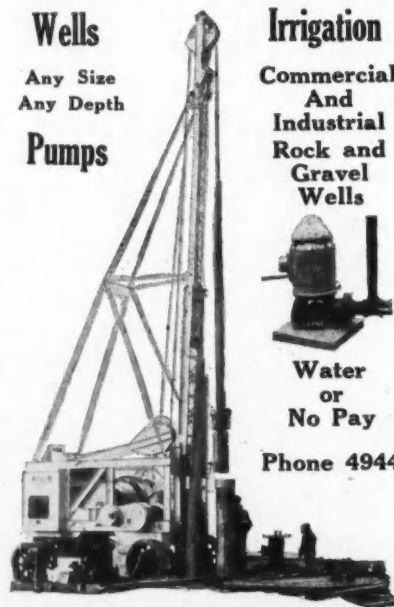
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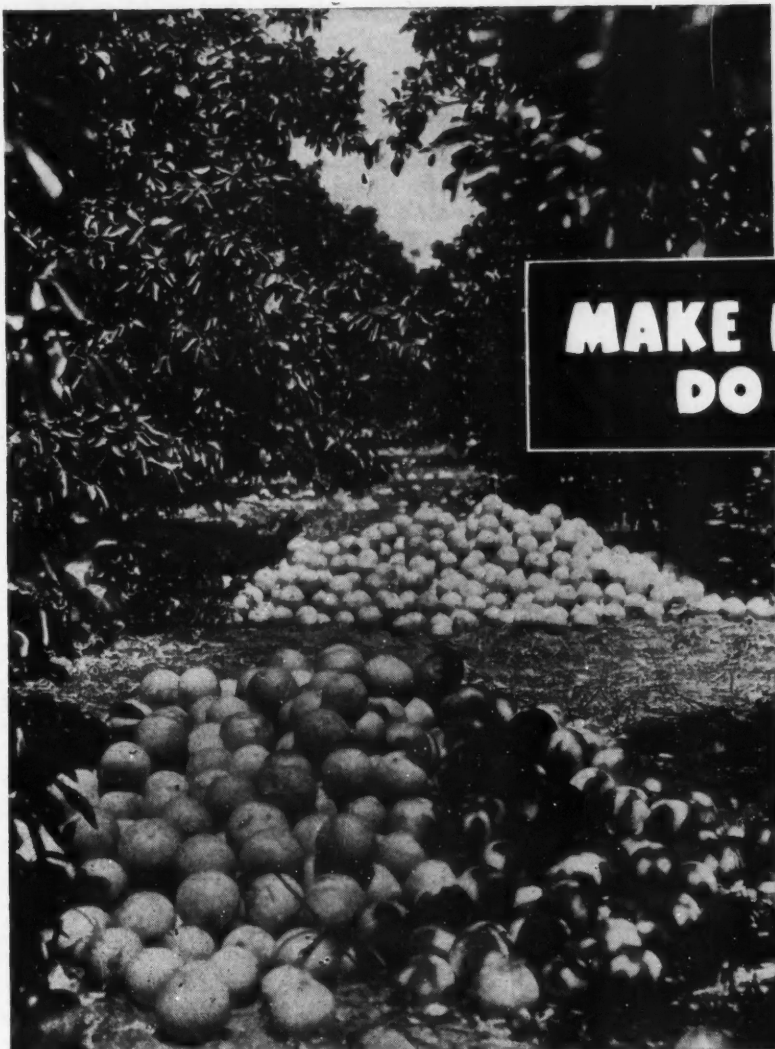
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## **FEED YOUR GROVES WITH ARMOUR'S PLANT FOODS**

Size and quality of the crop are largely determined by the condition of the trees in Spring. Be sure they have the right kind of nourishment, and enough of it. Use ARMOUR'S Plant Foods now in your Spring fertilizer application. When you apply ARMOUR'S you give your trees a

balanced formula of vital foods, quickly available. Order ARMOUR'S Fertilizer now from your nearby ARMOUR Agent.

A card to this office will bring an experienced Field Representative to help, without obligation, in problems of fertilization and grove care.

## **ARMOUR FERTILIZER WORKS**

**JACKSONVILLE, FLORIDA**

## 7th Annual Meeting Florida Soil Science Society Feb. 14-15-16

The Seventh Annual Meeting of the Soil Science Society of Florida will be held in Newell Hall, Agricultural Experiment Station, Gainesville, on Thursday, Friday and Saturday, February 14, 15 and 16, 1946.

Topics of interest to everyone engaged in agricultural or horticultural pursuits in Florida will be discussed by experts in the field of soil analysis and research. Subjects of peculiar interest to citrus growers include the following:

"Relation of Foliage and Fruit Analyses to the Fertilizer Requirements of Citrus," by Dr. B. R. Fudge of the Citrus Experiment Station, to be given on Friday morning.

### CITRUS FRUIT PRODUCTS RESEARCH 1/

(Continued from page 9)

room temperatures. Some studies are being conducted in an effort to determine the influence of some of the constituents on gas at elevated and room temperatures. Some studies are being conducted in an effort to determine the influence of some of the constituents on gas production as well as on darkening of the product. The information obtained so far has not been very conclusive. A number of compounds may be involved. The sugars appear to be responsible for some of the gas production under the influence of the acid present. Ascorbic acid seems to play some part but it is not clear whether it actually decomposes with the production of gas or acts as a catalyst. The actual weight of gas required to swell a can is quite small and there are a number of compounds present which could easily produce that amount.

(Concluded next issue)

Members of the Clearwater home demonstration club have bought a building site and begun construction work on their new club building, according to Miss Tillie Rosesel, Pinellas County home demonstration agent.

A sense of humor is essential on the farm.



## BALANCE

is essential in aquaplaning. The same is true in profitable farming. Soils that are deficient in any of the essential elements cannot produce a maximum yield of quality crops. Such soils are out of balance. It takes the right fertilizer in the right amount at the right time to maintain the balance in your soil!

This is Gulf Fertilizer's job. Gulf Fertilizers, benefiting by more than forty years of experience, are made to restore and maintain the balance in Florida soils. KEYED to your soils, they supply the elements needed to grow profitable crops.

Yes, for balanced soil, record production of profitable crops, use Gulf Fertilizers — and consult your local Gulf Field Man as to the right amount at the right time.

### Reminder for this Month:

At this time of year, bearing trees need a "shot in the arm" — an application of quickly available plant food to help set the new crop. Discuss your requirements with the Gulf Field man. There's a Gulf Top Dresser to meet your individual needs.

# GULF

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THE GULF FERTILIZER COMPANY  
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# You Can Build HEAVY CROPS If You Start Now..

Certain well defined procedures must be followed by the grower who would produce the largest quantities of high grade fruit.

And chief among these practices is to see that your trees are provided with ample quantities of fertilizer, rich in normal plant foods and with sufficient essential secondaries to do a bang up job —

And to see that this fertilizer is applied when it will do your trees the most good.

More and more growers realize with each passing season that we manufacture the kind of fertilizer they need — and that we deliver it in our own trucks **WHEN THEY NEED IT!**

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**FERTILIZER COMPANY**

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# The LYONIZER

Department

COMPILED BY THE LYONS FERTILIZER CO.

## Reports Of Our Field Men . . .

### POLK COUNTY

J. M. (Jim) Sample

Practically all groves in this county are coming out with a heavy bloom. We have plenty of moisture in the soil, the trees are in excellent condition and if we can get through the next few weeks without a frost we will have a nice crop of fruit set that will really make quality fruit for next shipping season. Growers have been very busy with their spray program and are planning to follow through during the entire season in an effort to have real quality this coming fall. Speaking of quality we do not have too much of it at the present time, and packing houses are still having a difficult time in getting early bloom fruit and leaving the late bloom for later picking. Practically all of early bloom fruit on mid-season varieties have been moved and a number of packing houses are starting to move the early bloom valencias. Prices are still within a satisfactory range, but there has been some decline in the grapefruit prices to canners. The spring application of topdresser is well under way and this will be over by the first of March.

### NORTH CENTRAL FLORIDA

V. E. (Val) Bourland

A large acreage of watermelons have been planted in this territory. Lake County has one of the heaviest plantings in history and with plenty of moisture at the present time they should get off to an excellent start. Vegetable crops in the Winter Garden section were damaged by cold weather and have never fully recuperated and produced normally. The vegetable crop to be planted this spring will be about normal as far as acreage is concerned. Practically all of the early bloom on mid-season varieties have been moved to market, but there is a considerable tonnage of late bloom remaining on these trees and this will not be moved until later in the season. A number of valencia crops have been sold and in a

few cases valencias have started moving to market. We are just about through with our fall and spring application of fertilizer but a number of growers will use topdresser in the next few weeks. Growers have been very busy with their spray program and we have some trouble with rust mite in recent weeks. Early bloom tangerines have been deteriorating in quality very rapidly during the past few weeks.

### WEST CENTRAL FLORIDA

E. A. (Mac) McCartney

Growers in this territory are in somewhat of a quandary at the present time as to the procedure that should be followed in the care of their groves. With recent rains and warm weather practically all groves are beginning to put out a bloom and with the hazard of a frost still a possibility many growers are wondering if they should go forward with their topdresser application. Well, most of them will go forward with fertilization and hope that there will be no frost. There is nothing we can do to retard the progress of the tree and therefore we are going to do all possible to assist it in setting a heavy crop of fruit. Growers have been very busy with their dormant spray program and this will be followed with a post bloom spray and then as soon as possible with oil to keep scale insects under control. Packers are still fussing about their picking problems caused by the various bloom that we have on the trees. However, most of the early bloom has been picked and it will be only a short while until valencias will be moving to market. The vegetable growers in this section will have a normal acreage of various varieties planted this spring. There is plenty of moisture in the soil and crops should start off in very fine shape.

### SOUTHWEST FLORIDA

Eaves Allison

Much bloom and new growth are beginning to appear in the groves over this territory. The

warm January weather and timely showers are no doubt the cause of this condition at this early date. It is a problem in the growers' minds whether to prepare for an extra early application of topdresser or to get ready to see this flush of bloom and growth knocked out by a seasonal frost. We have plenty of moisture in the soil and this might be in favor of continued mild weather. Infestation of rust mite and purple mite are pretty heavy in a number of groves in this section and control methods are being taken in conjunction with the dormant nutritional spray application. Citrus buying has slowed up some and prices are off at this time. Some late bloom grapefruit is being picked now but it is still marginal. Glads are moving in good volume from the Bradenton and Ft. Myers sections and the supply seems to be plentiful. Fall vegetables are nearly at an end and the growers are well along on their spring program.

### HILLSBOROUGH & PINELLAS COUNTIES

C. S. (Charlie) Little

The warm weather accompanied by plenty of rain has created a very favorable condition for trees to start their spring growth and this also means that we are getting plenty of bloom. Up to date the new bloom has been most prevalent on valencia oranges but other varieties are also blooming. Many growers that had planned to use a dormant copper zinc spray have been unable to do so because of the extremely early growth and bloom, and there is considerable hesitancy at this time about using this spray program while the trees are in bloom. There are only a few crops of early bloom mid-season oranges left in this territory, but we do have a heavy crop of late bloom on these trees and it will be necessary for practically all groves to be picked the second time. We will start our topdresser application right away and this will be over by the first of March. There is considerable activity being shown by buyers for early bloom valencia oranges

## ADVERTISEMENT—LYONS FERTILIZER COMPANY



There is a new fertilizer spreader on the market that has been giving outstanding results and where growers have given this machine a thorough trial they have been well pleased with its operation and are acclaiming it as the outstanding machine of this type on the market. The spreader is called the Lyonizer and can be mounted either on a truck or trailer. It is single fan operated and the poundage per tree can be controlled on either tree row, with the range of tonnage from only a very small poundage per tree up to very heavy application per tree.

The use of copper, manganese and zinc is an established practice in the production of crops in Florida. In former years we have been using these materials to increase our production per acre, but now we find these materials are beneficial in other ways in the successful production of crops. It has been shown that manganese increases the ascorbic acid (Vitamin C) content of tomatoes and zinc brings about the same result in citrus. Through the use of copper, manganese and zinc a marked improvement in color is often apparent in such crops as carrots, lettuce and onions. Another benefit which has been noted from the use of one or more of the rarer elements appears in the eating qualities of certain crops. The cooked vegetables from soils deficient in one or more of these elements are rather tasteless as compared with the rich full flavor of those which have been properly fertilized. Carrots and beets have shown an appreciable increase in sugar (sucrose) content following their applications.

There has been considerable discussion in recent months regarding the advertising program for Florida citrus fruits and it has been pointed out that we have done very little to educate the consuming public regarding the various minerals that is supplied in oranges and grapefruit. Most Florida soils in their native state are deficient in these minerals and it is necessary to supply them to our trees in the fertilizer program. Before we can safely guarantee any specific amount of any of these elements such as calcium or magnesium it is essential that the production problems be taken into consideration and ample amounts of these various elements be continuously supplied in the fertilizer and spray program. Growers will find that the various fertilizer companies will be the first in line to help develop such a program.

Prepacking of perishable produce, while by no means new, is attracting an immense amount of attention at the present time and every grower of vegetables is concerned, whether he is on a local market or growing for distant shipment. Here are some of the advantages: Prepacking carries the produce through to the consumer in much better shape than open handling. It protects the goods against dirt, evaporation and against damage through customer handling. Count or weight is carried through to the customer. The store labor of trimming weighing, wrapping and other handling is largely saved. The name of the producer or packer is carried through to the consumer.

**Uncle Bill**



## Citrus Cannery Hit By Steel Shortage

Canners of Florida citrus and juices have been hard hit by the shortage of can supplies due to the nationwide strike of steel workers. Florida can manufacturing plants, their supply of tin nearing exhaustion and with no prospect of early renewal of their supplies, have notified citrus canners that no more than 10 percent of normal supplies will be available until more adequate supplies of tinplate can be secured from the mills.

A few canners, it is said, have sufficient cans on hand to keep their plants operating for several weeks, but in most cases these plants are dependent upon shipments from the manufacturers for continued operation.

Even after the steel strike is settled, it is believed that there will be lag of probably three weeks before steel shipments to manufacturers can be resumed.

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ORTHO fieldmen will work with you to advise adequate and specific application.

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—the neutral zinc compound, the zinc content of which is readily available for plant use in correcting deficiency and maintaining vigor.



**Ortho**

**COPPER FUNGICIDE**

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**"53"**

— the insoluble copper protectant against melanose of citrus fruits. ORTHO "53" works well with wettable sulfur, where desired. Minimum spray residue does not aggravate scale problems unduly.

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ORLANDO, FLORIDA



Florida Growers have watched the Swift Program For Controlled Tree Feeding return run-down groves to top production and profitable returns in a short time. They have seen the Swift Program keep these groves profitably productive!

What is behind the Swift Program that assures its regular success? . . . . A combination of trained grove experts and a practical, proved inspection program. It's "know-how" and the will to make the plant food combinations required by individual groves that makes the Swift Plan for Controlled Tree Feeding so successful.

A new, greatly enlarged Swift Plant Food Factory will soon be under construction at Winter Haven. When it is completed more Florida Citrus Growers will have an opportunity of using the Swift Plan for Controlled Tree Feeding!



**SWIFT & COMPANY, PLANT FOOD DIVISION**  
**BARTOW, FLORIDA**

### HOW MANY ORANGES AND GRAPEFRUIT ARE TOO MANY?

(Continued from page 7)

Florida citrus growers have had striking proof of the importance of all necessary minerals for growing healthy citrus trees. Not just nitrogen, phosphorus and potash are added to soil, but a complete mineral program is followed to maintain the health of trees and fruit. If it is important that a tree have a complete nutritional program, how much more important it is that people have complete and balanced foods. Outstanding nutrition experts unanimously agree that our knowledge of nutrition has not progressed far enough to enable us to substitute pills or elixirs for naturally balanced foods rich in minerals and vitamins. Citrus fruits are one of the basic seven for which no adequate substitute is known. The supply is equivalent to less than half of our minimum daily needs.

After observing American shoppers hunting butter, cigarettes and nylons the last four years, we can guess

that if the mass of them discover the importance of citrus fruit in the diet and learn that there isn't enough to go around, they will stand in line to get their share.

### CLASSIFIED

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The rate for advertisements of this nature is only five cents per word for each insertion. You may count the number of words you have, multiply it by five, and you will have the cost of the advertisement for one insertion. Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

**BIG CITRUS GROVE FOR SALE,** heavy producer, several varieties oranges and grapefruit, well located near railroad siding, fertile soil, good frost protection. Reasonably priced. For sale by Charlton & Associates, Valuation Engineers and Realty Appraisers, Ft. Lauderdale, Fla.

**FOR SALE—** ONE 20-H.P. Farquhar Locomotive Type Boiler in good condition. Garland C. Norris. P. O. Box 692, Lakeland, Florida.

**NOW BOOKING** orders for raising citrus trees on sour or lemon stock. John Grieshop Nursery, San Antonio, Florida.

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